baceous vegetation with increasing altitude is due to increased soil moisture and decreased rate of evaporation.

An analysis of the foliage shows that leaves with entire margins are more abundant in the lower stories than in the upper, and at lower elevations than at higher ones. Classified according to the system devised by RAUNKIAER, the plants over a meter in height are found to show but three leaf sizes, and the number of species with microphyll, mesophyll, and macrophyll leaves are, for the most part, Dipterocarp forest, respectively 4: 79: 9; for the mid-mountain forest 4:61: 5; and for the mossy forest 8:8:0, showing a decided decrease in leaf size with increase in elevation.

The Philippine vegetation is made more attractive to the reader by numerous good photographs reproduced on excellent plates.—GEO. D. FULLER.

Transpiration studies.—A series of papers by SAYRE[9] contains some interesting results regarding transpiration from hairy leaves. The leaves of the mullein, *Verbascum Thapsus*, offer more resistance to water loss in darkness than in light, in still air than in wind, and respond rather more to changes in environment than do the smooth leaves of tobacco, *Nicotiana* sp. The removal of the hairs of the mullein leaves resulted in no change of resistance in still air and light, and but slightly reduces resistance in wind and light. There was a greater reduction of resistance to water loss caused by the removal of hairs in still air and darkness, as under such conditions transpiration is entirely cuticular. Hence it appears that, in this plant at least, hairs as a covering affording protection against ordinary intensities of wind and light are quite inefficient and may be disregarded. The stomatal water loss is 20–40 times the cuticular, and only the latter is influenced by the removal of the hairs.

Transpiration, humidity, evaporation, and sunshine were recorded along with the water loss from sealed potted plants. Stomatal transpiration is shown to be governed by various factors which control the opening and closing of the stomatal pores, and by the diffusion gradient. An increasing saturation deficit of the intercellular spaces of the mesophyll is regarded as important in increasing the resistance of the leaf to water loss while stomata are open, but as of no effect after stomata are closed by darkness.

The tobacco and *Verbascum Thapsus* show a rhythm in the transpiration curve in darkness for one day only succeeding a day of normal light exposure, but *V. Blattaria* exhibits no such rhythm under the same conditions.—GEO. D. FULLER.

---

[9] SAYRE, J. D., Comparative transpiration of tobacco and mullein. Ohio Jour. Sci. **19**:422–426. *fig. 1.* 1919.

———, Factors controlling variations in the rate of transpiration. *Loc. cit.* **19**:491–509. *figs. 9.* 1919.

———, The relation of hairy leaf coverings to the resistance of leaves to transpiration. *Loc. cit.* **20**:55–75. *fig. 7.* 1920.